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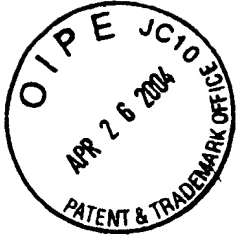
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

IN RE APPLICATION OF : Albert James Yovichin, Daniel Ray Downing, and
James Alfred Benzing, II

FOR : **Hot Forming System to Produce Pre-Cured
Innerliners**

SERIAL NO. : 09/831,393

FILED : August 20, 2001

EXAMINER : Geoffrey L. Knable

ART UNIT : 1733

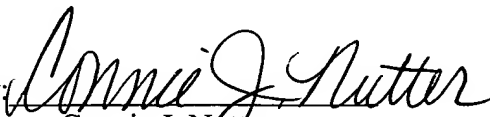
LAST OFFICE ACTION : August 13, 2003

ATTORNEY DOCKET NO. : 30163.30197

Akron, Ohio 44308-1471
April 26, 2004

CERTIFICATE OF MAILING

I hereby certify that this **APPEAL BRIEF** is being deposited with the United States Postal Service on this date 4/26/04 in an envelope marked as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 Mailing Label Number EL 975277865 US addressed to: Mail Stop: Appeal Brief – Patent, Commissioner of Patents and Trademarks, P.O. box 1450, Alexandria, VA 22313-1450.

By: 
Connie J. Nutter

Mail Stop: Appeal Brief – Patent
Commissioner of Patents and Trademarks
P.O. box 1450
Alexandria, VA 22313-1450

BRIEF OF APPELLANTS

Dear Sir:

This is an appeal from the advisory action of the Examiner mailed December 16, 2003, rejecting claims 1, 3-5, and 10. The Appellant's brief is accompanied by the required fee under Section 1.17(c). Following are the nine appeal brief items, under appropriate headings and in proper order, as required under 37 C.F.R. § 1.192(c).

I. REAL PARTY IN INTEREST

The real party in interest in this case is The Goodyear Tire and Rubber Company, and the inventors listed in the caption are employees of the Real Party in Interest.

II. RELATED APPEALS AND INTERFERENCES

No other appeal or interferences are known that would directly affect, be directly affected by, or have a bearing on the Board's decision in the pending Appeal.

III. STATUS OF CLAIMS

This application is a national phase application claiming priority from a PCT application pursuant to 35 U.S.C. § 371, having serial number PCT/US98/25239, and filed on November 25, 1998. Nine claims were originally filed, of which Claims 1, 6, 8 and 9 were independent. In the PCT application, claim 9 was cancelled and the limitations contained therein were incorporated into claim 8. The International Preliminary Examination Report stated that these eight claims were novel and had industrial applicability, but lacked inventive step. See Exhibit A.

During prosecution of the national phase application in the United States (the instant case), the Examiner rejected original claims 1-9 for obviousness. After providing amendments, which included canceling claim 9 and adding claim 10, the Examiner issued a final rejection, rejecting claims 1-8 and 10 under 35 U.S.C. § 103(a) for obviousness. Amendment B was filed

amending claims 1 and 10, and canceling claims 2, and 6-8. This appeal followed receipt of the Examiner's advisory action.

The status of the claims, as set forth in the Advisory Action is as follows:

Allowed claims: None;

Claims objected to: None;

Claims rejected: 1, 3-5, and 10.

IV. STATUS OF AMENDMENTS

Amendment B was filed subsequent to the Final Office Action, mailed on August 13, 2003. Amendment B, filed November 11, 2003, amended claims 1 and 10, and cancelled claims 2 and 6-8. In the advisory action of December 16, 2003, the examiner entered the amendments of Amendment B, stating the rejection under 35 U.S.C. § 112, first paragraph, with respect to claim 10 was overcome. Further, the rejections under 35 U.S.C. § 103(a) under U.S. Patent No. 4,089,360 to Bohm alone were withdrawn, which applies to claims 1, 3-5 and 10 (originally applying to claims 1-8 and 10). The remaining obviousness rejection for claims 1, 3-5, and 10 was maintained by the Examiner. A Petition for Revival of an Application for Patent Abandoned Unavoidably Under 37 C.F.R. § 1.137(a) was filed on February 24, 2004. The Petition also included a Notice of Appeal. To date, Applicant has not received a decision on the Petition.

V. SUMMARY OF THE INVENTION

The present invention is directed to the method for providing a pre-cured innerliner 50 for a pneumatic tire assembly 94. The pneumatic tire assembly is built on an associated tire building drum 48 and subsequently mounted into an associated shaping and vulcanizing mold 90. The method includes the steps of providing calendering means 10 for forming a continuous strip of elastomeric material in a press 40, comprising a press platen 80 for curing the continuous strip. The calendering means 10 is able to form the continuous strip of elastomeric material having a predetermined cross-sectional profile. See Specification, page 5, lines 24-29. The method is

characterized by the steps of utilizing the calendering means 10 to provide the continuous strip 12 of elastomeric material having a cross-sectional profile 66 including a center region 70 bounded by first and second lateral regions 72,74, wherein the center region has a maximum thickness T_1 at least twice a minimum thickness T_2 of the first lateral region. See Specification page 7, lines 2-10 and Figure 6. A press platen is provided with a pressing surface mating with the profiled surface 62 of the continuous strip 12. See Specification page 7, lines 11-15. See also Figure 7 and 8. Next, the press 40 is utilized to in-line cure a predetermined portion of the continuous strip of elastic material by engaging the press platen with the predetermined portion of the continuous strip to preserve the cross-sectional profile. The predetermined portion has a length equal to or greater than a circumference of the associated tire building drum. See page 6, lines 12-18 and Figure 3. The predetermined portion is wound onto the associated tire building drum after utilizing the press. See Specification page 7, lines 19-21. The predetermined portion is cut to provide splice surfaces 58, 60 after utilizing the press. See Specification page 7, lines 21-22. Finally, the pre-cured innerliner 50 is formed by joining the splice surfaces 58, 60. See Specification page 7, lines 22-24.

Another aspect of the invention is to provide a method for providing a pre-cured innerliner for a pneumatic tire assembly when winding the predetermined portion of the elastomeric material onto a holding role before winding it onto an associated tire building drum. See Specification page 5, line 31 to page 6, line 1. With respect to the splice surfaces 58, 60, the splice surfaces have a splice angle of at least 80°. The splice surfaces are joined by adhesive. See Specification page 6, lines 19-25.

VI. ISSUES

Claims 1, 3-5 and 10 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 4,166,883 to Seiberling (hereinafter “Seiberling”) or GB 2224031 to Uniroyal (hereinafter “Uniroyal”), in view of U.S. Patent No. 4,065,338 to Mirtain (hereinafter “Mirtain”) and/or U.S. Patent No. 4,089,360 to Böhm (hereinafter “Böhm”). At issue is whether or not

claims 1, 3-5, and 10 are patentable under 35 U.S.C. § 103 over Seiberling or Uniroyal in view of Mirtain and/or Böhm.

VII. GROUPING OF CLAIMS

Claims 1 and 3-5 stand or fall together. Claim 10 is separately patentable from claims 1 and 3-5. Claim 10 is a separate independent claim, which is broader in scope than claim 1. Arguments pertaining to claim 10 being separately patentable are set forth in part B of the Argument.

VIII. ARGUMENT

The Examiner rejected Claims 1, 3-5 and 10 under 35 U.S.C. § 103 as being unpatentable over Seiberling or Uniroyal in view of Mirtain and/or Böhm. At issue is whether or not the the present invention is obvious in light of the cited references.

It is the Examiner's position that although Seiberling does not teach a profiled pre-cured innerliner, it suggests procuring the innerliner before assembly with the tire. The secondary references allegedly provide a motivation to profile the liner so that it is thicker at the central areas. The Examiner believes that the secondary references evidence that the problem that when a flat built tire is shaped to toroidal form, a uniform liner must of necessity become thinner towards the crown because of the diameter/circumference of the material is increasing with toroidal shaping. The Examiner believes the references identify a known solution to this problem (other than thickening the entire liner), namely, to make the liner thicker in the central regions to counteract the thinning with shaping. To form a liner in such contoured form would therefore have been obvious for the advantage of avoiding the thinning of the liner, this also enabling the use of less overall material since a thicken than necessary overall thickness layer need not be used.

With respect to Applicant's arguments, the Examiner proffers the following reasoning for not accepting the same. As to arguments made with respect to the curing press and plate configuration, the Examiner states the primary references suggest procuring the innerliner (to

enable bladderless cure), these curing method including “usual methods of curing” in Seiberling (col. 4, ll. 16-31) and including a conventional sulfur cure in Uniroyal. The Examiner concludes it would have been clear to one having ordinary skill in the art to adopt well known and conventional means to cure rubber sheets. As to the platen configuration, the Examiner submits it would be obvious that the platens should be appropriately shaped to the desired shape of the liner. If one is trying to mold or cure a certain shape material, they typically would be expected to use a cure press with platens that are of the desired shape.

The Examiner also states in response to Applicant’s argument that Seiberling did not teach or suggest providing the cured portions to be of a length equal or greater than the drum circumference, the Examiner states that Seiberling and Uniroyal desire a complete cured internal air which would have required that the liner be cured over at least the circumferential length of the drum. With respect to the arguments that Mirtain is directed to an uncured liner for use with the bladder cure, this is not disputed by the Examiner. The Examiner proffers that the Mirtain reference provides clear evidence that when a flat built tire is shaped to toroidal form, a uniform liner must of necessity become thinner toward the crown because of the fact that the diameter or circumference of the material is increasing with toroidal shaping. The Examiner agrees that the Mirtain reference is not concerned with trying to provide a bladderless cure and thus only describes the more conventional uncured liner, the Examiner submits that one of ordinary skill would have appreciated the problem of thinning of the liner and would be present regardless whether the liner is cured or pre-cured. With respect to the Böhm reference, the Examiner states that this supports the finding to provide a liner that is an important part pre-cured as well as contoured to avoid the same thinning problems, such as what is stated in column 3, lines 18+; column 8, lines 32+. With respect to the teaching away argument proffered by Applicant for Mirtain, the Examiner is not persuaded because Mirtain with respect to final curing of the tire not pre-curing of the liner.

A. CLAIMS 1 AND 3-5

Numerous reasons exist why the rejection under § 103 is improper. First, there is no basis to combine Seiberling or Uniroyal with Mirtain and/or Bohm to arrive at the present invention. In fact, the cited references teach away from the present invention because neither reference contemplates nor solves the same problem as that in the present invention. Second, Mirtain teaches away from the present invention. Third, all claim limitations must be considered, and elements of the claims at issue are still not taught by any of the cited references.

1. There is no basis to combine Seiberling or Uniroyal with Mirtain and/or Bohm to arrive at the present invention.

To present a prima facie case of obviousness, where the claims are rejected over a combination of references under 35 U.S.C. § 103, there must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. See Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 8 U.S.P.Q.2d 1468, 1475 (Fed. Cir. 1988). That knowledge cannot come from the Applicant's invention itself. The Examiner may not pick and choose from various references to arrive at the claimed invention absent some teaching or suggestion in the references themselves. "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious.... [O]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." See In re Fritch, 972 F.2d 1260 (Fed. Cir. 1992) (quoting In re Fine, 837 F.2d 1071, 1075 (Fed. Cir. 1988)). Numerous cases have held that the when considering the references, the question is whether "one skilled in the art with the references before him [could] make the combination of elements here claimed without exercise of the inventive faculty." See In re Gruskin, 110 U.S.P.Q. 288, 292 (CCPA 1956), In re Goepfrich, 136 F.2d 918, 920 (CCPA 1943).

Seiberling does not teach or suggest a *method* of forming a profiled innerliner utilizing calendaring means to provide a continuous strip of elastomeric material having the claimed cross-sectional profile. Further, the reference does not teach or suggest the steps of: providing a

press platen with a pressing surface mating with a profiled surface of the continuous strip; and utilizing the curing press to in-line cure a predetermined portion of the continuous strip of elastomeric material by engaging the press platen with the predetermined portion of the continuous strip to preserve the cross-sectional profile.

Additionally, Seiberling does not teach or suggest a method of providing the predetermined portion having a length equal to or greater than a circumference of said associated tire building drum; winding the predetermined portion onto said associated tire building drum *after* the step of utilizing the curing means; cutting the predetermined portion to provide splice surfaces after the step of utilizing the curing means; and, forming the pre-cured innerliner by joining said splice surfaces.

In Seiberling, the disclosed innerliner 6 contemplates a uniform thickness throughout its width. There is no suggestion that the pre-cured innerliner may be modified according to the Examiner's proposal. Seiberling teaches an uncured innerliner used to form a tire in a mold having a bladder. The reference does not teach or suggest a *method* for forming a pre-cured innerliner. Therefore, there is no motivation for a combination of the references.

Uniroyal teaches particular rubber compositions that are partially cross-linked to a gas-impermeable state after pre-heating, for example, at a temperature of 150°C for approximately five minutes or initially cross-linked via electron radiation. There is no teaching or suggestion of a method for using a press to in-line cure an innerliner in order to preserve the claimed predetermined cross-sectional shape.

With respect to the secondary references, Mirtain provides a profiled *uncured* liner. There is no teaching or suggestion of a method for using a press to pre-cure a portion of a continuous strip in order to preserve a cross-sectional profile. According to the teachings of this reference, the profile is smoothed out during the cure process. This reference therefore teaches away from preserving the profile as the liner is cured. Further, there is no motivation to combine Mirtain with either Seiberling or Uniroyal.

Böhm teaches selective pre-curing of layers of a laminate. The targeted cure occurs upon exposure to irradiation. This reference does not teach or suggest a method of using a press with a

profiled platen in order to pre-cure an innerliner while maintaining a predetermined cross-sectional profile. There is also no motivation to combine Bohm with either Seiberling or Uniroyal.

Claims 3-5 each ultimately depend from claim 1. As such, the comments addressed to claim 1 apply equally well to claims 3-5 and are incorporated herein by reference. As to claim 3, none of the cited references teach or suggest a method including the step of winding a predetermined pre-cured portion of the continuous strip having a predetermined cross-sectional profile onto a holding roll before it is wound onto a tire building drum. According to 35 U.S.C. § 103, the invention *as a whole* must be considered. As to claim 4, none of the cited references show singly or in combination all of the features of claim 4 including providing a splice angle of at least 80°. As to claim 5, none of the cited references show singly or in combination all of the features of claim 5 including using an adhesive to join the splice surfaces.

2. All Claim Limitations Must Be Present.

For a rejection under 35 U.S.C. § 103 to be proper, all claims limitations must be taught by the cited references. There are no references cited that show a method of providing a pre-cured innerliner incorporating a step of using a profiled press platen that is adapted to receive and cure a predetermined portion of a profiled calendared strip so that the profile is preserved during cure. The Examiner's mere insistence that such a modification would be obvious does not make it so. Further, there are no references that show that the predetermined portion of the profiled calendared strip that is cured has a length equal to or greater than a circumference of an associated tire building drum. Because all claim limitations must be present and considered as a whole, the Examiner has failed to prove a prima facie case of obviousness.

3. The Prior Art Must Have Revealed A Reasonable Expectation Of Success In Making Or Carrying Out The Claimed Invention By One Of Ordinary Skill In The Art.

It is not enough that the prior art suggest the combination recited in the claims; there must also be some reasonable expectation of success for the suggested combination. See In re Dow

Chem. Co., 837 F.2d 469, 473 (Fed. Cir. 1988). Mirtain is directed toward a method of fabricating a tire in a mold having a bladder. A ribbed innerliner is provided in its uncured state so that air or other undesirably trapped fluid is evacuated from between the bladder and the liner. The evacuation is assisted by the “ironing out” deformation of the ribs and the transformation thereof into a smooth surface corresponding to the smooth surface present by the exterior of the bladder engaged therewith. See Mirtain, column 5, lines 18-25. One having skill in the art would not reasonably expect success by modifying the pre-cured innerliner of Seiberling according to the teachings of the uncured liner of Mirtain.

4. The Subject Matter Of The Claims Must Be Viewed As A Whole At The Time The Invention Was Made.

Each claim limitation must be considered and given its proper weight. Claim 1 provides that a predetermined portion of a calendered strip is pre-cured before it is incorporated into the final product. Bohm teaches that the laminate is cured after it is incorporated into the final structure. See Abstract. Therefore, *when viewed as a whole*, the claimed invention cannot be obvious in light of the Examiner’s combination.

Since Uniroyal is used to also indicate a pre-cured innerliner, its combination with the Mirtain and/or Bohm also falls short of making Applicant’s invention obvious.

5. The Standard Is “Obvious To Do” Not “Obvious To Try.”

The Examiner asserts that the claimed parameters of the inventive innerliner would be obvious in view of the cited references. However, neither Mirtain or Böhm give guidance as to the parameters of the thickness variation of the innerliner. There is usually an element of *obviousness to try* in any research endeavor. Patentability based on that as a test would be contrary to statute. In re Tomlinson, 363 F.2d 928 (C.C.P.A. 1966).

B. CLAIM 10

Claim 10 provides a *method* for providing a pre-cured innerliner formed by utilizing calendering means to provide a profiled elastomeric strip. A press is then utilized to in-line cure a predetermined portion of the strip so as to preserve the profile. The predetermined portion has a length equal to or greater than a circumference of an associated tire building drum. As set forth in the arguments relating to claim 1 above, none of the references singly or in combination teach or suggest the invention as set forth in claim 10. No proper modification or combination of references provides a profiled calendered strip that is fed to a press for in-line cure where the press platen preserves the profile of the strip. Applicant respectfully asserts that Claim 23 is patentably distinct from the other claims since it is an independent claim and broader in scope.

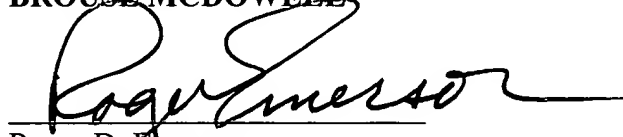
For the foregoing reasons, it is submitted that the Examiner's rejection of the claims was erroneous, and reversal of the decision is respectfully requested.

The Commissioner is hereby authorized to charge Deposit Account No. 07-1725 in the amount of \$330.00 according to 37 C.F.R. 1.17(c).

The Commissioner is hereby authorized to charge any additional fees due, or credit any overpayment, to Deposit Account No. 07-1725.

Respectfully submitted,

BROUSE MCDOWELL



Roger D. Emerson
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500 First National Tower
106 S. Main Street
Akron, Ohio 44308-1471

040426
Date

APPENDIX (37 C.F.R. 1.192(c)(7))

Claim 1. A method for providing a pre-cured innerliner (50) for a pneumatic tire assembly (94), said pneumatic tire assembly being built on an associated tire building drum (48) and subsequently mounted into an associated shaping and vulcanizing mold (90), the method including the steps of providing calendering means (10) for forming a continuous strip of elastomeric material and a press (40), comprising a press platen (80) for curing said continuous strip, said calendering means being able to form said continuous strip of elastomeric material having a predetermined cross-sectional profile, the method characterized by the steps of:

utilizing said calendering means to provide said continuous strip (12) of elastomeric material having a cross-sectional profile (66) including a center region (70) bounded by first and second lateral regions (72,74), said center region having a maximum thickness T_1 at least twice a minimum thickness T_2 of said first lateral region;

providing said press platen with a pressing surface mating with a profiled surface (62) of said continuous strip (12);

utilizing said press to in-line cure a predetermined portion of said continuous strip of elastomeric material by engaging said press platen with said predetermined portion of said continuous strip to preserve said cross-sectional profile, said predetermined portion having a length equal to or greater than a circumference of said associated tire building drum;

winding said predetermined portion onto said associated tire building drum after said step of utilizing said curing means;

cutting said predetermined portion to provide splice surfaces (58,60) after said step of utilizing said curing means; and,

forming said pre-cured innerliner (50) by joining said splice surfaces.

Claim 3. The method of claim 1 further characterized by the step of:

winding said predetermined portion onto a holding roll before said step of winding said predetermined portion onto said associated tire building drum.

Claim 4. The method of claim 1 wherein said splice surfaces have a splice angle of at least 80°.

Claim 5. The method of claim 1 wherein said splice surfaces are joined with an adhesive.

Claim 10. A method for providing a pre-cured innerliner (50) for a pneumatic tire assembly (94), said pneumatic tire assembly being built on an associated tire building drum (48) and subsequently mounted into an associated shaping and vulcanizing mold (90), the method including providing calendering means (10) for forming a continuous strip of elastomeric material having a predetermined cross-sectional profile, the method comprising the steps of:

utilizing said calendering means to provide said continuous strip (12) of elastomeric material having a profiled surface (62) and a cross-sectional profile (66) including a center region

(70) bounded by first and second lateral regions (72,74), said center region having a maximum thickness T_1 at least twice a minimum thickness T_2 of said first lateral region;

providing a press with a pressing surface (82) which mates with said profiled surface;

and,

utilizing said press to in-line cure a predetermined portion of said continuous strip of elastomeric material and preserve said cross-sectional profile by engaging said pressing surface with said predetermined portion, said predetermined portion having a length equal to or greater than a circumference of said associated tire building drum.

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

EMERSON, Roger, D.
c/o BROWN, Robert, W.
Patent & Trademark Dept. - D/823
The Goodyear Tire & Rubber Company
Akron, OH 44316-0001
ETATS-UNIS D'AMERIQUE

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing
(day/month/year) 19.02.2001

Applicant's or agent's file reference

J. DN 1998-168

IMPORTANT NOTIFICATION

International application No.
PCT/US98/25239

International filing date (day/month/year)
25/11/1998

Priority date (day/month/year)
25/11/1998

Applicant

THE GOODYEAR TIRE & RUBBER COMPANY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference /.		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US98/25239	International filing date (day/month/year) 25/11/1998	Priority date (day/month/year) 25/11/1998	
International Patent Classification (IPC) or national classification and IPC B29D30/00			
Applicant THE GOODYEAR TIRE & RUBBER COMPANY et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 4 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application 			
Date of submission of the demand 30/05/2000		Date of completion of this report 19.02.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel: +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Militzer, E Telephone No. +49 89 2399 2895 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US98/25239

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-4,6,7,9	as published	
5,5a,8	with telefax of	02/02/2001

Claims, No.:

1,2,3 (part)	as published	
3 (part),4-8	with telefax of	02/02/2001

Drawings, sheets:

1/7-7/7	as published
---------	--------------

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US98/25239

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-8
	No:	Claims
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-8
Industrial applicability (IA)	Yes:	Claims 1-8
	No:	Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

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Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Claims 1 to 5:

The Applicant states that the subject matter of claim 1 is not rendered obvious because US 4 065 338 (D1) undoubtedly describes an uncured innerliner having a particular profile and that documents GB 996 385 (D2), GB 2 224 031 (D3) or DE 44 34 270 (D4), although they teach the precuring of an innerliner, it is not known to prevulcanize an innerliner having the particular cross-section of D1.

The examiner cannot follow this point of view for the reason that claim 1 appears to comprise a **juxtaposition of features** but not a combination of features. Generally speaking a juxtaposition of features arises when two or more totally independent problems are solved. In that case each problem and its individual solution is considered separately. Therefore, each individual problem and its solution can be examined using a different combination of prior art documents.

What the examiner has objected in the previous communication is that the subject matter of claim 1 lacks inventive step because the solution of the first problem is rendered obvious by the combination "general knowledge of the skilled man and D1" and the solution of the second problem is rendered obvious by the combination "general knowledge of the skilled and D2 or D3 or D4".

The objection of lack of inventive step is therefore recapitulated as follows.

In addition to the features cited in the preamble of claim 1 the following features cited in the characterizing part of claim 1 are usual in the art of manufacturing a tire assembly:

- winding the "continuous strip" on a building drum;
- cutting the "continuous strip" to provide splice surfaces; and
- forming said innerliner by joining said splice surfaces.

These features in combination with the preamble are comprised within the general knowledge of the man skilled in the art.

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The subject matter of claim 1 differs from this general knowledge in that:

- a) calendaring means are used to provide a continuous strip having the cross-sectional profile as defined in the first characterizing feature; and
- b) curing means are used to cure a predetermined portion of the continuous strip as defined in the second feature of the characterizing part of claim 1.

For the assessment of inventive step these differing features can be considered separately because there is no functional relationship between these features. Claim 1 is therefore merely a **juxtaposition** and not a true combination of features.

The first technical problem to be solved by feature a) can be seen in preventing reduction in thickness of the innerliner when the tire carcass is expanded.

The second technical problem to be solved by feature b) can be seen in avoiding the use of an internal bladder in the molding and vulcanizing step.

The first problem of the reduction in thickness of the innerliner during its expansion has been solved by US 4 065 338 - D1 - (see column 1, lines 21-25) by calendaring the strip in such a way that the cross-sectional profile includes an inner region having a greater thickness than the first and second lateral regions (see figures 10-12, column 4, lines 59-65). When considering figures 10 to 12 it can also be concluded that the thickness of the center portion is at least twice a minimum thickness of the lateral portions (see the center portion when compared to the edges of the strip).

The solution of the first technical problem is therefore rendered obvious by D1 when combined with the general knowledge of the man skilled in the art.

The second problem of avoiding a bladder in the moulding and vulcanization step has also been solved by the prior art in the same manner as claimed in the present application. For instance GB 996 385 - D2 - (page 1, lines 62,63); GB 2 224 031 - D3 - (see claims 3-6); DE 44 34 270 - D4 - (see claim 1) all suggest to prevulcanize or partially vulcanize the innerliner to render the innerliner impermeable to the heating medium. Thereby the use of a heating bladder can be avoided.

The solution of the second technical problem is therefore rendered obvious by

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D2 or D3 or D4 when combined with the general knowledge of the man skilled in the art.

Consequently, the subject matter of claim 1 as a whole appears to lack inventive step (Article 33(3) PCT).

The features of dependent claims 3 to 5 fall within the customary practice of the skilled person. The subject matter of these claims appear to lack therefore inventive step either.

2. Claims 6 to 8:

Document D1, figures 10 to 12, describes an innerliner for a tire assembly comprising a cross-sectional profile having a center region bounded by first and second lateral regions, said center region having a thickness at least twice a thickness of said first lateral region.

The subject matter of independent claim 6 differs therefore therefrom only in the sense that the innerliner is precured to be used in an associated bladder-less shaping and vulcanizing mold.

The technical problem to be solved is to shape and cure the tire without using a bladder (bladder-less shaping and curing process).

Documents D2 to D4 are all directed to a bladder-less shaping and curing process. In order to avoid the use of a bladder, documents D2 to D4 teach to partially cure the innerliner. Indeed partially curing the innerliner renders the innerliner impervious to the shaping and heating medium which is inflated in the green tire during shaping and curing process.

It appears therefore to be obvious for the man skilled in art to partially cure the innerliner according to D1 if it is planned to use the innerliner in a bladder-less shaping and curing process.

The subject matter of claim 6 appears to lack inventive step (Article 33(3) PCT).

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The features of dependent claims 7 and 8 appears to fall within the customary practice of the skilled person. The subject matter of these claims appear to lack therefore inventive step either.

Re Item VII

Certain defects in the international application

Document D1 and one of the document D2 to D4 describing a pre-cured innerliner to be used in a bladder-less shaping and curing process should be identified in the description (Rule 5.1. a) ii) PCT).

Re Item VIII

Certain observations on the international application

Since claim 1 has not been amended in respect to the objection of lack of clarity of the feature "curing a predetermined portion", the objection of lack of clarity (Article 6 PCT) of claim 1 is maintained. Indeed, this feature is vague because the cured portion is not defined. The strip could be partially cured when compared to its thickness but could be also partially cured when compared to its width or length. The Applicant states that this feature refers to the external surface of the elastomeric material which will be in contact with the building drum and with the heating medium. Claim 1 does however not contain such a limitation.

In view of the arguments brought by the Applicant, the objection of lack of clarity of features "winding/cutting said predetermined portion" is no longer maintained.

Claim 6 mentions that the center region has a thickness at least twice a thickness of the first lateral region only. Since the innerliner has two lateral regions (see line 13, of claim 6) it is not clear which one of the two lateral regions is taken into consideration when the thickness of the central region is measured. Claim 6 is unclear in this respect (Article 6 PCT).

The examiner maintains the objection that the embodiment of the invention described on page 8, line 26 to page 9, line 5, does not fall within the scope of claim 1. The Applicant states that the mentioned embodiment is covered by the new claim 8. This

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statement cannot be followed by the examiner. Indeed, the embodiment of page 8, line 26 to page 9, line 5 relates undoubtedly to an uncured profiled elastomeric strip. The independent claims 1 and 6 (and therefore dependent claim 8) all relate to precured innerliner. Consequently, there is an inconsistency between the claims and the description which leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear (Article 6 PCT).

of the surface of the annular tread perpendicular to the axial direction.

"Equatorial Plane (EP)" means the plane perpendicular to the tire's axis of rotation and passing through the center of its tread.

5 "Lateral" means an axial direction.

"Radially" and "radially" means directions radially toward or away from the axis of rotation of the tire.

"Radial Ply Tire" means a belted or circumferentially-restricted pneumatic tire in which the ply cords which extend from bead to bead are laid at cord angles between 65° and 90° with respect to the equatorial plane of the tire.

10 "Sidewall" means that portion of a tire between the tread and the bead.

"Tread" means a rubber or elastomeric component which when bonded to a tire carcass includes that portion of the tire that comes into contact with the road when the tire is normally inflated and under normal load.

15 Detailed Description of the Invention

Referring now to the drawings wherein the showings are for purposes of illustrating a preferred embodiment of the invention only and not for purposes of limiting the same, Figure 1 is a schematic representation of a process for forming a pneumatic tire. The preferred embodiment of the invention is used to form pneumatic
20 tires having large nominal rim diameters such as for off-road and farm vehicles. The innerliners for such vehicles may be in the range of 3.0 m (10 feet wide) and 4.6m (15 feet) long and weigh up to 102 kg (225 pounds). Utilizing molding techniques would require handling cylindrical innerliners having 3.0 m (10 foot) widths and 1.5 m (5 foot) diameters. In the preferred embodiment of the present invention, the steps
25 outlined in Figure 1 are a continuous process. In one embodiment of the invention, a contoured calendaring apparatus 10 is utilized to form a continuous strip of elastomeric material which is conveyed toward curing means 38. After cure, the elastomeric material is wound onto a tire building drum 48 to form a pre-cured innerliner. The pneumatic tire assembly is then built in a conventional manner and placed into a shaping
30 and vulcanizing mold. In the preferred embodiment, the elastomeric material is natural gum, although a multi-component material could be used.

5a.

In an alternate embodiment of the invention, after cure, the elastomeric material
5 is wound onto storage rolls and subsequently wound onto the tire building

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Referring now to Figure 9, a shaping and vulcanization mold 90 is shown in cross-section. An important aspect of the invention is that mold 90 does not require the use of a curing bladder to form a complete pneumatic tire. The mold 90 is constructed in any conventional manner and does not form a part of the present invention. The cured innerliner 50 forms the inner surface of the tire assembly 94 and is impervious to pressurized gas, steam, or hot water. The pressurized gas, steam or hot water is introduced into the mold 90 to provide sufficient pressure within the tire assembly 94 to force it against the mold wall and the innerliner 50 against the tire carcass so as to form a tread pattern in the tread portion and form any desired identification and indicia marks desired on the tire's surface. The tire assembly 94 is then cured and removed from the mold 90 in the form of a completed tire. During this process, the innerliner 50 is stretched to its final toroidal shape. Because center region 70 is subjected to the greatest amount of stretch, the center region 70 is initially at least twice as thick as the lateral regions 72, 74. For large nominal rim sized pneumatic tires for earthmover or farm vehicles, the center region 70 of innerliner 50 may exhibit greater than 100% stretch in diameter in the shaping and vulcanizing mold. In the finally shaped tire, the innerliner 50 exhibits nearly a uniform thickness throughout.

In an alternate embodiment of the invention, the cured elastomeric material is wound onto a holding roll (not shown). In that way, a continuous strip of cured innerliner material is available to form the innerliners 50. In another alternate embodiment, a separation liner (not shown) may be utilized with the holding roll.

In yet another embodiment of the invention, the cured continuous strip 12 is cut to length and formed into a cylinder (not shown) before being loaded onto a tire building drum 48.

Referring to Figures 2, in a further embodiment of the invention, the uncured profiled elastomeric strip 12 formed on calendaring apparatus 10 may be positioned onto tire building drum 48 without first passing through press 40. The material is therefore in an uncured state on the tire building drum 48. The material is then cut to length to provide splice surfaces 58 as 60, shown in Figure 4. The splice region only of the innerliner 50 is precured using a cure bar or other apparatuses and methods known in the art before the remaining tire components are

step of winding said predetermined portion onto said associated tire building drum.

4. The method of claim 1 wherein said splice surfaces have a splice angle of at least 80°.

5. The method of claim 1 wherein said splice surfaces are joined with an adhesive.

6. A precured innerliner (50) for a tire assembly for use in an associated bladder-less shaping and vulcanizing mold (90), the innerliner characterized by:
a cross-sectional profile (66) having a center region (70) bounded by first and second lateral regions (72,74), said center region having a thickness at least twice a thickness of said first lateral region.

7. The precured innerliner of claim 6 further characterized by:
a splice having an associated splice angle of at least 80°.

8. The precured innerliner of claim 6 further characterized by:
a precured splice region.

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